Florida Power & Light Company, 6501 South Ocean Drive, Jensen Beach, FL 34957

FPL

August 15, 2002

L-2002-143
10 CFR 50.90

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Proposed License Amendments
Risk-Informed One Time Increase in Integrated
Leak Rate Test Surveillance Interval

Pursuant to 10 CFR 50.90, Florida Power & Light Company (FPL) requests to amend Facility Operating Licenses DPR-67 and NPF-16 for St. Lucie Units 1 and 2. The proposed amendments revise Unit 1 and Unit 2 Technical Specifications Section 6.8.4.h, Containment Leakage Rate Testing Program, to allow a one time 5-year extension to the current 10-year test interval for the containment integrated leak rate test (ILRT). St Lucie has implemented the 10 CFR 50, Appendix J, Option B performance-based containment leak rate test program.

The proposed changes are submitted on a risk-informed basis as described in Regulatory Guide (RG) 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis*. The proposed changes to extend the ILRT surveillance interval are justified based on a combination of risk informed analysis and assessment of the containment structural condition utilizing ILRT historical results and containment inspection programs. The risk aspects of the justification have been prepared by the Combustion Engineering Owners Group (CEOG) and are presented in a joint applications report (JAR), WCAP–15691, *Joint Applications Report for Containment Integrated Leak Rate Test Interval Extension*, Revision 2, June 2002. WCAP-15691, Revision 2, was submitted to the NRC for review by CEOG letter CEOG-02-125 dated June 14, 2002. A brief description and history of St. Lucie Unit 1 and Unit 2 ILRT testing results and the containment inspection program are discussed in the CEOG report with a more detailed description provided in this submittal.

The Joint Applications Report provides the risk-informed supporting analysis to demonstrate that the increase in risk of extending the ILRT interval from 10 to 15 years is insignificant. That analysis, done in accordance with Regulatory Guide 1.174, shows that the increase in total plant risk due to the extended ILRT interval is less than one

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half of one percent. The change in large early release fraction (LERF) is only 5.7E-9/yr and 4.1E-9/yr, respectively, for St. Lucie Units 1 and 2 when the test interval is increased from 10 to 15 years. This submittal requests only a one time interval extension from 10 to 15 years.

Attachment 1 is a description of the proposed changes and the supporting safety analysis. Attachment 2 is a copy of CEOG letter CEOG-02-129 dated June 19, 2002. The attachments to CEOG-02-129 compare the St. Lucie Unit 1 and Unit 2 results obtained using WCAP-15691, Revision 02, methodology with those obtained using the Crystal River Unit 3 application methodology. Attachment 3 is the Determination of No Significant Hazards and Environmental Considerations. Attachments 4 and 5 are marked up copies of the proposed Technical Specification changes. Attachments 6 and 7 are copies of the retyped TS pages. There are no changes to the TS Bases associated with the proposed amendments.

The St. Lucie Facility Review Group and the Florida Power & Light Company Nuclear Review Board have reviewed the proposed amendments. In accordance with 10 CFR 50.91 (b)(1), a copy of the proposed amendments is being forwarded to the State Designee for the State of Florida.

Approval of these proposed license amendments is requested by January 7, 2003 to support the spring St. Lucie Unit 2 refueling outage (SL2-14). Please issue the amendments to be effective on the date of issuance and to be implemented within 60 days of receipt by FPL. Please contact George Madden at 772-467-7155 if there are any questions about this submittal.

Very truly yours,

Donald E. Jernigan
Vice President
St. Lucie Plant

DEJ/GRM

Attachments

cc: Mr. William A. Passetti, Florida Department of Health

STATE OF FLORIDA)
) ss.
COUNTY OF ST. LUCIE)

Donald E. Jernigan being first duly sworn, deposes and says:

That he is Vice President, St. Lucie Plant, for the Nuclear Division of Florida Power & Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information, and belief, and that he is authorized to execute the document on behalf of said Licensee.

Donald E. Jernigan

STATE OF FLORIDA

COUNTY OF ST LUCIE

Sworn to and subscribed before me

this 15 day of August, 2002
by Donald E. Jernigan, who is personally known to me.

Leslie J. Whitwell
Name of Notary Public - State of Florida

Leslie J. Whitwell
MY COMMISSION # DD020212 EXPIRES
May 12, 2005
BONDED THRU TROY FAIN INSURANCE, INC.

(Print, type or stamp Commissioned Name of Notary Public)

ATTACHMENT 1

DESCRIPTION OF THE PROPOSED CHANGES

AND

SAFETY ANALYSIS

ATTACHMENT 1

SAFETY ANALYSIS

INTRODUCTION

The proposed amendments revise Unit 1 and Unit 2 Technical Specifications (TS) Section 6.8.4.h, Containment Leakage Rate Testing Program, to allow a one time 5-year extension to the current 10-year test interval for the containment integrated leak rate test (ILRT). St Lucie has implemented the 10 CFR 50, Appendix J, Option B performance-based containment leak rate test program.

The proposed changes are submitted on a risk-informed basis as described in Regulatory Guide (RG) 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis.* The proposed changes to extend the ILRT surveillance interval are justified based on a combination of risk informed analysis and assessment of the containment structural condition utilizing ILRT historical results and containment inspection programs. The risk aspects of the justification have been prepared by the Combustion Engineering Owners Group (CEOG) and are presented in a joint applications report (JAR), WCAP–15691, *Joint Applications Report for Containment Integrated Leak Rate Test Interval Extension*, Revision 2, June 2002. Revision 2 of WCAP-15691 was submitted to the NRC for review by CEOG letter CEOG-02-125 dated June 14, 2002. A brief description and history of St. Lucie Unit 1 and Unit 2 ILRT testing results and the containment inspection program are discussed in the CEOG report with a more detailed description provided in this submittal.

The Joint Applications Report provides the risk-informed supporting analysis to demonstrate that the increase in risk of extending the ILRT interval from 10 to 15 years is insignificant. That analysis, done in accordance with Regulatory Guide 1.174 shows that the increase in total plant risk due to the extended ILRT interval is less than one-half of one percent. The change in large early release fraction (LERF) is only 5.7E-9 /yr and 4.1E-9 /yr, respectively for St. Lucie 1 and 2 when the test interval is increased from 10 to 15 years. The JAR demonstrates that, from a risk perspective, an extension in the interval out to 20 years has an insignificant impact on risk. This is consistent with the findings of NUREG-1493, *Performance Based Containment Leak-Test Program.* This submittal requests only a one time interval extension from 10 to 15 years.

BACKGROUND

The testing requirements of 10 CFR 50 Appendix J provide assurance that leakage through the containment, including systems and components that penetrate containment, does not exceed design values anticipated up to and including the design basis accident. The integrated leakage rate test (ILRT), or Type A test as referred to in 10 CFR 50 Appendix J, is primarily an overall test of the containment structure.

10 CFR 50 Appendix J was revised effective October 26, 1995 to allow use of Option B, Performance-Based Requirements. Regulatory Guide (RG) 1.163, *Performance-Based Containment Leak-Test Program*, September 1995, provides an acceptable method to the NRC for compliance with the performance-based option. RG 1.163 endorses Nuclear Energy Institute (NEI) 94-01, *Industry Guideline for Implementing Performance Based-Option of 10 CFR 50 Appendix J*, including the criteria for test interval selection.

NEI 94-01 specifies an initial Type A test interval of 48 months, but allows an extended test interval of 10 years, based on two consecutive successful tests. There is also a provision for extending the test interval an additional 15 months consistent with standard scheduling practices for TS surveillance requirements. There have been six ILRTs performed on St. Lucie Unit 1 and four ILRTs performed on Unit 2, all of which have been successful. Therefore, the current surveillance interval for both St. Lucie units is 10 years.

The NRC acceptance of a change from the previous frequency of 3 times in 10 years to once in 10 years was based on NUREG-1493, *Performance Based Containment Leak Rate Test Program*. The NUREG stated that reducing the frequency to once in 20 years between tests would lead to an imperceptible increase in risk. Currently, discussions are in progress between the NRC and NEI concerning a permanent extension of the 10-year ILRT test surveillance interval. A one time change based on adequate site specific assessment would defer the immediate requirement for the ILRT and will allow time for acceptance of an industrywide change to the surveillance interval through a revision to NEI 94-01.

Several requests have already been approved by the NRC for the one time surveillance interval extension to 15 years for the Type A test. This proposed change is similar to the recently approved request by Waterford 3.[1]

DESCRIPTION OF PROPOSED CHANGE

The proposed amendments to the Unit 1 and Unit 2 Administrative Technical Specification 6.8.4.h would add an exception to the commitment to follow the guidelines of RG 1.163. This exception is an extension of the currently specified 10-year interval (from the last ILRT) to a 15-year interval on a one-time basis. The 10-year interval is specified in NEI 94-01.

FPL proposes to revise the St. Lucie Unit 1 and Unit 2 Administrative Technical Specification 6.8.4.h as follows.

[1] NRC Letter to Entergy Nuclear Operations, Inc., Waterford Steam Electric Station, Unit 3 – Issuance of Amendment Re: Integrated Leakage Rate Testing Interval Extension (TAC No. MB2461), dated February 14, 2002.

Current Unit 1 and Unit 2 TS wording states in part:

> ...This program is in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," as modified by the following exception:
>
> a. Bechtel Topical Report, BN-TOP-1 or ANS 56.8-1994 (as recommended by R.G. 1.163) will be used for Type A testing.

Proposed Unit 1 revised wording with the additional exception:
(Additions are shown in bold Italics font.)

> ...This program is in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," as modified by the following exception***(s)***:
>
> a. Bechtel Topical Report, BN-TOP-1 or ANS 56.8-1994 (as recommended by R.G. 1.163) will be used for Type A testing.
>
> ***b. The first Type A test performed after the May 1993 Type A test shall be no later than May 2008.***

Proposed Unit 2 revised wording with the additional exception:
(Additions are shown in bold Italics font.)

> ...This program is in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," as modified by the following exception***(s)***:
>
> a. Bechtel Topical Report, BN-TOP-1 or ANS 56.8-1994 (as recommended by R.G. 1.163) will be used for Type A testing.
>
> ***b. The first Type A test performed after the June 1992 Type A test shall be no later than June 2007.***

JUSTIFICATION FOR THE PROPOSED CHANGE

The proposed changes to extend the ILRT surveillance intervals are justified based on a combination of risk informed analysis and assessment of the containment structural condition utilizing ILRT historical results and containment inspection programs. The risk aspects of the justification have been prepared by the CEOG and are presented in a joint applications report (JAR), WCAP–15691. The report has been transmitted for NRC review separately from this transmittal. A brief description and history of St. Lucie Unit 1 and Unit 2 Type A testing and the containment inspection program are discussed in the

CEOG JAR (see WCAP-15691, Appendices C and D, Sections C1.2 and D1.2, respectively) with a more detailed description provided in this evaluation.

The JAR provides the risk-informed supporting analysis to demonstrate that the increase in risk friom extending the ILRT interval from 10 to 15 years is insignificant. That analysis, done in accordance with RG 1.174, shows that the increase in total plant risk due to the extended ILRT interval is less than one half of one percent. The change in large early release fraction (LERF) is only 5.7E-9/yr and 4.1E-9/yr, respectively, for St. Lucie Units 1 and 2 when the test interval is increased from 10 to 15 years. Note that the JAR demonstrates that, from a risk perspective, an extension in the interval out to 20 years has an insignificant impact on risk. This is consistent with the findings of NUREG-1493. This submittal requests only a one time interval extension from 10 to 15 years.

The risk assessment documented in the Joint Applications Report and St. Lucie specific appendices demonstrates:

1. The risk of extending the ILRT interval for Type A tests from its current interval of 10 years to 15 years was evaluated for public exposure impact (as measured in person-rem/yr) as described in the JAR. The risk assessment predicts a slight increase in risk when compared to that estimated from current requirements. For the change from a 10 year test interval to a 15 year test interval, the increase in total risk (person-rem/year within 50 miles) was found to be 0.49 percent for Unit 1 and 0.30 percent for Unit 2. Therefore, the risk when compared with other potential severe accident contributors is considered small.

2. RG 1.174 provides guidance for determining the risk impact of plant specific changes to the licensing basis. RG 1.174 defines very small changes in the risk guidelines as increases in the core damage frequency (CDF) less than 1E-6 per reactor year and increases in LERF less than 1E-7 per reactor year. Since, as noted in the JAR, the Type A test does not impact CDF, the relevant criterion in evaluating the proposed change is LERF. The increase in LERF resulting from a change in the Type A test frequency from the current once in 10 years to once in 15 years is estimated to be 5.7E-9/yr for Unit 1 and 4.1E-9/yr for Unit 2. The cumulative increase in LERF resulting from a change in the Type A test interval from the original three in 10 years to once in 15 years is estimated to be 1.4E-8/yr for Unit 1 and 1.0E-8/yr for Unit 2. Increasing the Type A test interval to 15 years is considered to be a very small change in LERF.

3. RG 1.174 also encourages the use of risk analysis techniques to help ensure and show that the proposed change is consistent with the defense-in-depth philosophy. The only element of the multiple barrier concept that is potentially affected by this change is the measure of reliability for containment vessel integrity. The percent increase in LERF was estimated to be 0.14 percent for Unit 1 and 0.07 percent for Unit 2 in going from the current 10-year interval to 15 years. The cumulative

change for going from a test interval of 3 times in 10 years to once in 15 years is estimated at 0.34 percent for Unit 1 and 0.17 percent for Unit 2. A more recognized term is conditional containment failure probability (CCFP), shown in Attachment 2. The increase in CCFP was calculated to be 0.11 percent when going from the current requirements to a 15-year test interval and 0.32 percent when going from 3 times in 10 years to once in 15 years for both St. Lucie units. It is concluded that the very small impact on containment failure probability demonstrates that consistency with defense-in-depth philosophy is maintained for the proposed change.

The results of the previous Type A tests for St. Lucie Units 1 and 2 are reported below. Data is reported using the 95 percent confidence level estimate with the exception of the Unit 1 pre-operational test.

Unit 1 ILRT Data

Date	Leak Rate (Wt. % / Day)	Acceptance Criteria (Wt. % / Day)
7/5/1975*	0.025	0.375
5/26/1979§	0.057	0.240
4/28/1983	0.153	0.375
3/21/1987£†	0.335	0.375
4/6/1990£†	0.195	0.375
5/20/1993£†	0.319	0.375

Unit 2 ILRT Data

Date	Leak Rate (Wt. % / Day)	Acceptance Criteria (Wt. % / Day)
12/2/1982*	0.026	0.375
5/17/1986§†	0.092	0.263
4/3/1989£†	0.117	0.375
6/17/1992£†	0.053	0.375

* Pre-operational test
§ Reduced pressure test
£ Test results obtained using BN-TOP-1
† Includes difference of as-found/as-left local leak rate test (LLRT) results (NRC Information Notice 85-71)

All Type A tests performed at St. Lucie passed the as-found acceptance criteria. It should be noted that later results reflect the addition of calculation conservatism due to the use of the BN-TOP-1 methodology and addition of the negative difference in leakage resulting from LLRTs performed due to maintenance prior to the respective ILRT. These results demonstrate a history of satisfactory performance of both the leak tight capability and structural integrity of the containment vessel.

Containment leak-tight and structural integrity is also verified through periodic visual inspections of the containment vessel and appurtenances. Historically, the ILRT was preceded by a visual inspection of containment thus ensuring that the inspection was performed 3 times in 10 years. Following the adoption of Option B to 10 CFR 50 Appendix J, the ILRT surveillance interval was extended to 10 years, however, the visual inspection schedule was maintained on the previous frequency of 3 times in 10 years. The results of these inspections indicate that there have been no problems with structural integrity or material condition of the containment vessel and only minor coatings issues.

There have been two conditions identified by other inspection processes that relate to the material condition of the containment boundary. The first condition, documented in condition reports (CR) 97-0890 (Unit 2) and 01-1018 (Unit 1), concerned deterioration of the moisture barrier at the interface of the concrete floor and containment vessel. Areas in both units were selected at various points where the moisture barrier exhibited cracking and/or partial disbonding from the vessel or slab, and the sealant material was removed to allow inspection of the containment vessel. Generally, only staining or light surface corrosion was noted with a few instances of pitting observed. Evaluations have determined that the localized areas of concern are not a concern with respect to the integrity of the containment vessel. The site Corrective Action Program is utilized to track additional inspections and provides a long-term plan for any required material improvements or repairs to the moisture barrier and the containment vessel. The second condition involved external corrosion, due to moisture accumulation from condensation, on the component cooling water penetrations to containment as initially documented in CR 97-1799. Corrective actions include removal of corrosion products, inspection of components and respective thickness measurements, application of protective coatings, and installation of anti-sweat insulation. Corrective actions, inspections, and evaluation of inspection results implemented to date on the most affected penetrations have provided objective evidence that the piping degradation is minor and a large thickness margin is available before encroaching upon design requirements. Based on these results, the remaining penetrations are in satisfactory condition. The site corrective action program is tracking completion of corrective actions for the remaining penetrations. Both of these conditions were identified prior to implementation of the ASME Section XI, Subsection IWE inspection program at St. Lucie Plant. Based on the inspections, repairs, and evaluation of these issues it has been determined that augmented inspection was not required in accordance with IWE-1240.

The ASME Section XI, Subsection IWE[2] provides the requirements for inservice inspection of the containment pressure vessel and integral attachments. The St. Lucie

[2] ASME Section XI, Subsection IWE, Requirements for Class MC and Metallic Liners of Class CC Components of Light-Water Cooled Plants, 1992 Edition.

Units 1 and 2 IWE inspection program[3] has been implemented for St. Lucie Unit 1 on April 7, 2000 and St. Lucie unit 2 on August 9, 2000. All inspections have been completed for the first period of the first 10 year surveillance interval on both St. Lucie units with similar results to those determined under the previous described inspection process. In addition, inspections are performed, as required by 10 CFR 50.65, for maintenance rule related programs in which the penetration areas and overall structure are periodically walked down. These inspections, and the results to date, provide assurance of continued leak-tight service and structural integrity of the containment vessel.

Local leak rate testing (Type B & C test) is performed to verify the leak-tight integrity of containment penetration valves, bellows, seals, gaskets, and airlocks. The frequency of these tests is unaffected by the change in the Type A test frequency. This provides continuing assuredness of the leak-tight integrity for barriers integral to the containment vessel with potential degradation mechanisms different than the overall vessel structure.

This proposal is similar to license amendment requests that have been submitted and approved for a one time extension of the ILRT surveillance interval from 10 years to 15 years. Most recently, Waterford 3 received approval for an extension utilizing the CEOG Joint Application Report on this topic.

RESPONSE TO FIVE TYPICAL NRC CONTAINMENT INSPECTION QUESTIONS

In a similar license amendment request by Crystal River, the NRC staff requested a response to five questions in a letter from the NRC to Florida Power Corporation (FPC) dated July 6, 2001. In subsequent submittals, it has become understood that these questions should be addressed in order to more efficiently support the NRC staff review. The questions from the letter and the St. Lucie responses are provided below.

Because the containment inservice inspection (ISI) requirements mandated by 10CFR50.55a and leak rate testing requirements of Option B of Appendix J complement each other in ensuring the leak-tightness and structural integrity of the containment, the staff needs the following information to complete its review of the license amendment request.

Question 1: None of the references describe (or summarize) the containment ISI program being implemented at [St. Lucie 1 and 2]. Please provide a description of the ISI methods that provide assurance that in the absence of an ILRT for 15 years, the containment structural and leak tight integrity will be maintained.

Response 1: The Containment Inservice Inspection program at St. Lucie Units 1 and 2 is described in detail in ISI/IWE-PSL-1/2-PROGRAM, *Metal Containment Inservice Inspection Program*, which provides the rules and requirements. The specific areas and

[3] ISI/IWE-PSL-1/2-Program, Containment Building Metal Containment Inservice Inspection Program, Revision 1, January 2001.

components scheduled for inspection in accordance with the program are provided in ISI/IWE-PSL-1-PLAN, *ASME Section XI, Subsection IWE Containment Building Metal Containment Inservice Inspection Plan for St Lucie Unit 1,* and ISI/IWE-PSL-2-PLAN, *ASME Section XI, Subsection IWE Containment Building Metal Containment Inservice Inspection Plan for St Lucie Unit 2.* The program requirements include inspection of containment surfaces, pressure retaining welds, bolting, and components, seals, gaskets, and moisture barriers using visual, surface, and volumetric techniques as required. Examinations that detect flaws or evidence of degradation are documented through the site corrective action program and are dispositioned in accordance with the requirements of IWE-3000. Personnel performing NDE are qualified and certified in accordance with IWA-2300 of the 1992 Edition with 1992 Addenda of ASME Section XI and implemented by procedure CSI-QI-9.1, *Qualification and Certification of Nondestructive Examination Personnel.* The program complies with the requirements of 10 CFR 50.55a.

Question 2: IWE-1240 requires licensees to identify the surface areas requiring augmented examinations. Please provide the locations of the containment liner surfaces that [St. Lucie Units 1 and 2] have identified as requiring augmented examination and a summary of the findings of the examinations performed.

Response 2: The ASME Section XI, Subsection IWE inspection plan has been implemented for St. Lucie Unit 1 on April 7, 2000 and St. Lucie Unit 2 on August 9, 2000. All inspections have been completed for the first period of the first 10-year surveillance interval on both St. Lucie units. There are currently no identified areas at either St. Lucie Unit 1 or Unit 2 that require augmented inspection in accordance with IWE-1240.

There have been two conditions identified by other inspection processes that relate to the material condition of the containment boundary. The first condition involved a problem with cracking of the moisture barrier at the interface of the concrete floor and containment vessel. This was initially documented and evaluated in St. Lucie CR 97-0890. Subsequent inspections have been performed as part of the corrective action process on both units. Material was removed and the containment vessel wall was inspected in areas where the deterioration of the moisture barrier existed. These inspections determined that only light surface corrosion or discoloring existed with pitting noted in some locations. FPL's evaluation based on the results of several inspections has determined that this issue does not affect the structural or leak-tight integrity of the containment vessel. The second condition related to the containment vessel material condition involved external corrosion, due to moisture accumulation from condensation, on the component cooling water penetrations to containment as initially documented in CR 97-1799. Corrective actions included removal of corrosion products, inspection of components and respective thickness measurements, application of protective coatings, and installation of anti-sweat insulation. Corrective actions, inspections, and evaluation on the most affected penetrations have provided objective evidence that the piping degradation is minor and a large thickness margin is available before encroaching upon design requirements. The site corrective action program has been utilized to track additional inspections and long term corrective action activities. Both of these conditions were identified prior to implementation of the IWE inspection program at St. Lucie. Based on the inspections, repairs, and evaluation of these issues it has been determined that augmented inspection was not required in accordance with IWE-1240

Question 3: For the examination of seals and gaskets, and examination and testing of bolts associated with the primary containment pressure boundary (examination categories E-D and E-G), relief from the requirements of the code had been requested. As an alternative, it was proposed to examine them during the leak rate testing of the primary containment. With the flexibility provided in Option B of Appendix J for Type B and C testing (as per NEI 94-01 and Regulatory Guide 1.163), and the extension requested in this amendment for Type A testing, please provide your schedule for examination and testing of seals, gaskets, and bolts that provide assurance regarding the integrity of the containment pressure boundary.

Response 3: ISI Relief Request IWE-01 for seals and gaskets and ISI Relief Request IWE-02 for examination and testing of bolt torque and tensioning were submitted to the NRC by letter L-2000-104 on April 24, 2000. These relief requests were authorized for use by NRC letter dated July 13, 2000.

As discussed in Relief Request IWE-01, seals and gaskets for containment penetrations are tested in accordance with 10 CFR 50 Appendix J. Type B tests are required to be performed at a frequency not to exceed 60 months (air locks not to exceed 30 months), in accordance with plant procedures. The extension of the Type A testing does not affect this frequency. Thus, all penetrations utilizing gaskets and seals as part of the primary containment boundary are tested for leak-tight integrity within each 10-year inspection interval.

As discussed in Relief Request IWE-02 for torque or tension testing of all bolting not disassembled during the inspection interval, 10 CFR 50 Appendix J Type B testing proves that the bolt torque or tension remains adequate to ensure the leak-tight integrity of the containment. The extension of the Type A testing does not affect the frequency of the Type B testing which, as previously stated, is required to be performed within each 10-year inspection interval. In addition, it is noted that the exposed surfaces of bolted connections shall be visually examined in accordance with the requirements of Table IWE-2500-1, Examination Category E-G. A general visual inspection of the entire containment, once each inspection interval, shall be conducted in accordance with 10 CFR 50.55a(b)(2)(x)(E).

Question 4: Stainless steel bellows have been found to be susceptible to trans-granular stress corrosion cracking, and the leakage through them is not readily detectable by Type B testing (see NRC Information Notice 92-20). If applicable, please provide information regarding inspection and testing of the bellows, and how such behavior has been factored into the risk assessment.

Response 4: NRC Information Notice 92-20, *Inadequate Local Leak Rate Testing*, discussed inadequate Type B local leak rate testing of two-ply stainless steel bellows. St. Lucie Units 1 and 2 each have five penetration assemblies that incorporate two-ply mechanical bellows. These are the two main feedwater, two main steam, and fuel transfer penetrations. Review of site operating experience reports and plant drawings demonstrate that wire mesh is installed between the two-plies of the bellows ensuring that an adequate gap exists to measure leakage when performing the required Type B tests. These bellows have been tested each outage since startup for both units with satisfactory results.

Question 5: Inspections of some reinforced concrete and steel containment structures have found degradation on the uninspectable (embedded) side of the drywell steel shell and steel liner of the primary containment. These degradations cannot be found with visual (i.e. VT-1 or VT-3) examinations unless they are through the thickness of the shell or liner, or 100 perecent of the uninspectable surfaces are periodically examined by ultrasonic testing. Please provide information addressing how potential leakage under high pressure during core damage accidents is factored into the risk assessment related to the extension of the ILRT.

Response 5: The potential for containment leakage is explicitly included in the risk assessment. By definition, the intact containment cases (Class 1) include a leakage term that is independent of the source of the leak. The containment failure Class 3A and 3B cases model the potential leakage impact of the ILRT interval extension. These cases include the potential that the leakage is due to a containment shell failure. The assessment shows that even with the increased potential to have an undetected containment flaw or leak path, the increase in risk is insignificant.

CONCLUSION

The proposed Technical Specification changes regarding the exceptions to RG 1.163 and NEI-94-01 requirements, which would extend the ILRT surveillance interval, are considered acceptable. The risk-based analysis demonstrates that the proposed change results in only a minimal increase in risk. Historical ILRT data and a continuing containment inspection program, coupled with LLRT of the individual containment penetrations, provide assurance of the leak-tight integrity of the containment vessel.

ATTACHMENT 2

COPY OF CEOG LETTER CEOG-02-129

Westinghouse

Westinghouse Electric Company
Nuclear Services
Engineering Services
2000 Day Hill Road
P O Box 500
Windsor, Connecticut 06095
USA

June 19, 2002
CEOG-02-129

Mr. George Madden
Florida Power & Light Company
6501 South Ocean Drive [A1A]
Jensen Beach, FL 34957

Subject: **Transmittal of CEOG Task 2027 Crystal River ILRT Comparison Results**

Dear Mr. Madden:

The purpose of this letter is to forward a comparative evaluation of extending the containment integrated leak rate test interval at St. Lucie-1 & 2 using results obtained from WCAP-15691, Rev 02 with those obtained using the Florida Power Corporation (Crystal River) methodology. These results are provided as a component of CEOG Task 2027 in accordance with your request.

If there are any questions, please contact Bob Jaquith at (860) 731-6447 or me at (860) 731-6240.

Sincerely,

Virgil Paggen (for)

P. J. Hijeck
Program Manager
CE Owners Group

Attachments

cc: J. A. Hurchalla (FPL)
A. J. DeGrasse, (WEC RSM)

Attachment 1

Sensitivity Evaluation Comparing the CEOG JAR ILRT Methodology with an Alternate Previously Approved Methodology for Saint Lucie Unit 1

Attachment 1

SENSITIVITY EVALUATION COMPARING THE CEOG JAR METHODOLOGY WITH AN ALTERNATE PREVIOUSLY APPROVED METHODOLOGY FOR SAINT LUCIE UNIT 1

The FPL submittal references the Combustion Engineering Owners Group (CEOG) Joint Applications Report (JAR) (Reference 1) for the supporting technical justification for the request of a one-time extension of the Integrated Leak Rate Test (ILRT) interval to 15 years

The purpose of this write-up is to present a plant-specific analysis using the methodology that was used for the Crystal River 3 application (Reference 2). Note that FPL believes the methodology applied in the CEOG JAR to be reasonable and consistent with good practice in risk-informed evaluations. The results of the CEOG evaluation, which represents the use of a best-estimate approach to establish the probability of the small isolation failures of interest, demonstrate an even better risk justification of the request The previously approved methodology utilizes a 95th percentile estimate of the probability of the small isolation events and the results reflect a somewhat greater impact of the change on overall risk. Other differences between the methodologies will be described in the body of the evaluation below. The change is demonstrated to be risk insignificant in both methodologies.

Both of the methodologies followed the same general approach to the evaluation of the risk of the interval extension There were differences in the approaches in the assumptions and in the development of a probability estimate for the release class 3 events. The methodologies:

- Both utilize the EPRI TR-104285 (Reference 3) release classes to categorize the various containment failure scenarios
- Both establish the plant-specific frequencies for each EPRI release class.
- Both define estimated leakage for each release class.
- Both quantify the risk for each release class by multiplying the class frequency times the assumed leakage.
- Both evaluated a baseline case (3 tests in 10 years), a current case (1 test in 10 years), and the proposed case (1 test in 15 years).

Table 1 summarizes the treatment of each of the EPRI Release Classes and provides a summary of some of the differences between the CEOG JAR and the CR3 methodologies.

Table 1
EPRI Release Class Definitions

Release Class (Ref. 3)	Description	CR3 Submittal	CEOG JAR (Table C2-2 if Reference 1)
1	No containment failure	Frequency reduced as Class 3 increases; leakage magnitude increases to 2 L_a	Frequency reduced with Class 3 increase; considered leakage of L_a
2	Large isolation failures	No change from baseline consequence measures; considered leakage of 35 L_a	No change from baseline consequence measures; considered leakage of 200 L_a
3	Isolation failures	3a: small leaks, 10 L_a, non-LERF 3b: large leaks, 35 L_a, LERF Probability derived using 95th %-ile χ^2 distribution of NUREG-1493 data	3a small leaks, 25 L_a, non-LERF 3b large leaks, 200 L_a, LERF Probability derived using log-normal distribution of NUREG-1493 data
4,5	Other small isolation failures (LLRT)	No change from baseline consequence measures; not analyzed	No change from baseline consequence measures; not analyzed
6	Other isolation failures	No change from baseline consequence measures, considered leakage of 35 L_a	No change from baseline consequence measures, considered leakage of 70 L_a
7	Induced failures	No change from baseline consequence measures, considered *leakage of 100* L_a	No change from baseline consequence measures, *considered leakage of 560* L_a
8	Bypass	Characterized by SGTR scenario – not impacted by ILRT extension	Characterized by SGTR and ISLOCA – not impacted by ILRT extension

Evaluation of Baseline ILRT Interval

The plant-specific evaluation of risk for the baseline case ILRT interval for Saint Lucie Unit 1 is presented in Table 2. The release frequencies for the Class 2, 6, 7, and 8 bins are taken from the CEOG JAR, which had compiled these data based on the Saint Lucie Unit 1 PSA. As noted in Table 1, the risk associated with the Class 4 and 5 bins is not impacted by the ILRT interval and is not analyzed here. The release frequencies for the Class 3a and 3b bins are determined based on the previously approved methodology (See next paragraph). The release frequency for Class 1 is the value of core damage frequency (CDF) reduced by the frequencies of the Class 3a and 3b scenarios. (Note – the CEOG JAR had utilized a value of CDF representative of sequences in which the containment remains intact. This value was approximately 76% of total CDF. The previously approved methodology used total CDF. Total CDF will be used in this plant-specific evaluation.)

The Class 3a and 3b frequencies in the previously approved methodology were determined based on a 95th percentile χ^2 distribution of the NUREG-1493 data. For the baseline ILRT interval (3 tests *in 10 years), this resulted in a frequency for Class 3a of 0.064 (Reference 4) times CDF and a* frequency for Class 3b of 0.021 (Reference 5) times CDF. These frequencies are used in the Saint Lucie Unit 1 evaluation presented in Table 2. Note the total CDF for Saint Lucie Unit 1 is 2.99E-05 per year and the intact containment release frequency is 2.26E-05 per year based on the current plant risk model.

Table 2
Saint Lucie Unit 1 Risk Evaluation of Baseline ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	FREQ(intact)-FREQ(3a)-FREQ(3b)-FREQ(6) = 2.01E-05 (Reference 7)	L_a = 1 84E+05 (Reference 6)	3 69
2	2 26E-08	35 L_a = 6 44E+06	0.15
3a	0 064 x CDF = 1.91E-06	10 L_a = 1.84E+06	3 52
3b	0 021 x CDF = 6 28E-07	35 L_a = 6 44E+06	4 04
6	0 00E-00	35 L_a = 6 44E+06	0.00
7	3 15E-06	100 L_a = 1 84E+07	57.96
8	4 09E-06	1.39E+08 (Reference 6)	568 51
		Total Risk	637.87

In the CEOG JAR, a risk contribution of the intact containment sequences (i e., Classes 1, 3a, and 3b) was determined Using the previously approved methodology, the risk contribution due to the ILRT Type A testing was considered to be due to the Class 3a and 3b scenarios From Table 2, it can be seen that the risk contribution associated with the ILRT testing interval considering Classes 3a and 3b is:

$$\% \text{ Risk} = [(\text{Risk}_{\text{Class 3a}} + \text{Risk}_{\text{Class 3b}}) / \text{Total Risk}] \times 100$$

$$= [(3.52 + 4.04) / 637.87] \times 100$$

$$= 1.19\%$$

In the CEOG JAR, it was also assumed that the Class 2, 3b, 6, 8, and half the Class 7 (half the class 7 was considered to be 'early') scenarios could lead to large early releases and thus, contribute to large early release frequency (LERF). The previously approved methodology focused only on the Class 3b scenario, which is the only one affected by the consideration of the ILRT interval. As the parameter of concern in the evaluation is ΔLERF, and because Class 3b is the only class affected by the interval extension, ΔLERF is compared on a consistent basis in both methodologies. Thus, for this evaluation the baseline LERF is the Class 3b frequency, or 6.28E-07 per year.

Risk Evaluation of the Current ILRT Interval (1 in 10 years)

This evaluation of the 'once in 10 years' interval will be performed using the same approach as taken above for the baseline case. The frequencies for all release classes, except Class 1, 3a, and 3b, are unaffected by the change in the interval and remain as in Table 2. And the releases for all of the classes are the same as those shown in Table 2 for the baseline case

The increased probability of not detecting excessive leakage in a Type A test directly impacts the frequencies of the Class 3 events. Based on the previously approved methodology, the Class 3a and 3b frequencies are determined by simply multiplying the baseline frequency by a factor of 1.1. With this change in the Class 3 frequencies, the Class 1 frequency is also adjusted to preserve the total CDF. The evaluation of the current interval is presented in Table 3.

Table 3
Saint Lucie Unit 1 Risk Evaluation of Current ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	FREQ(intact)-FREQ(3a)-FREQ(3b)-FREQ(6) = 1.98E-05 (Reference 7)	L_a = 1 84E+05 (Reference 6)	3 64
2	2 26E-08	35 L_a = 6 44E+06	0 15
3a	1.1 x 0 064 x CDF = 2.10E-06	10 L_a = 1.84E+06	3.87
3b	1.1 x 0.021 x CDF = 6 91E-07	35 L_a = 6 44E+06	4 45
6	0 00E-00	35 L_a = 6 44E+06	0.00
7	3 15E-06	100 L_a = 1.84E+07	57.96
8	4 09E-06	1.39E+08 (Reference 6)	568 51
		Total Risk	638.58

As was noted above for the baseline evaluation:

- the risk contribution due to the Type A test interval is [(3.87 + 4.45) / 638.58] x 100, or 1.30%.
- the LERF for the current interval evaluation is the Class 3b frequency, or 6.91E-07 per year.

Risk Evaluation of the Proposed ILRT Interval (1 in 15 years, one-time)

This evaluation of the 'once in 15 years' interval will be performed using the same approach as taken above for the baseline case. The frequencies for all release classes, except Class 1, 3a, and 3b, are unaffected by the change in the interval and remain as in Table 2. And the releases for all of the classes are the same as those shown in Table 2 for the baseline case.

The increased probability of not detecting excessive leakage in a Type A test directly impacts the frequencies of the Class 3 events. Based on the previously approved methodology, the Class 3a and 3b frequencies are determined by simply multiplying the baseline frequency by a factor of 1.15. With this change in the Class 3 frequencies, the Class 1 frequency is also adjusted to preserve the total CDF. The evaluation of the current interval is presented in Table 4.

Table 4
Saint Lucie Unit 1 Risk Evaluation
of Proposed ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	CDF- freq(3a)-freq(3b) = 1.97E-05	L_a = 1.84E+05	3 62
2	2 26E-08	35 L_a = 6 44E+06	0 15
3a	1.15 x 0 064 x CDF = 2 20E-06	10 L_a = 1.84E+06	4 05
3b	1.15 x 0 021 x CDF = 7.22E-07	35 L_a = 6 44E+06	4 65
6	0 00E-00	35 L_a = 6 44E+06	0 00
7	3 15E-06	100 L_a = 1.84E+07	57.96
8	4 09E-06	1.39E+08	568 51
		Total Risk	638.94

As was noted above for the baseline evaluation·

- the risk contribution due to the Type A test interval is [(4.05 + 4.65) / 638.94] x 100, or 1.36%.
- the LERF for the current interval evaluation is the Class 3b frequency, or 7.22E-07 per year.

Conditional Containment Failure Probability

Another parameter of interest in evaluating the risk impact of a change to the ILRT interval is the conditional containment failure probability (CCFP). In the CEOG JAR methodology, ΔLERF was considered to be directly related to ΔCCFP. The results using that approach were a ΔCCFP of 0.14% due to the proposed interval compared to the current interval, and 0.32% due to the change to the proposed interval compared to the baseline case. In the previously approved methodology that was used in the plant-specific evaluation developed in this submittal, CCFP was defined as:

CCFP = 1 – (frequency of no containment failure sequences / CDF), or
CCFP = 1 – [freq (Cl1)+freq (Cl3a)]/CDF

Further, the sequences representing no containment failure were considered to be the Class 1 and 3a events. Thus, using this approach and the information from Tables 2, 3, and 4, the ΔCCFP between the current ILRT interval and the proposed ILRT interval may be derived by:

$$\Delta CCFP_{c\ to\ p} = \{[freq\ (Cl1) + freq\ (Cl3a)]_c - [freq\ (Cl1) + freq\ (Cl3a)]_p\} / CDF$$

$$= \{[1.98E\text{-}05 + 2.10E\text{-}06] - [1.97E\text{-}05 + 2.20E\text{-}06]\} / 2.99E\text{-}05$$

$$= 0.0011, \text{ or } 0.11\%$$

Similarly, the impact of the proposed ILRT interval compared with the baseline ILRT interval is given by.

$$\Delta CCFP_{b\ to\ p} = \{[freq\ (Cl1) + freq\ (Cl3a)]_b - [freq\ (Cl1) + freq\ (Cl3a)]_p\} / CDF$$

$$= \{[2.01E\text{-}05 + 1.91E\text{-}06] - [1.97E\text{-}05 + 2.20E\text{-}06]\} / 2.99E\text{-}05$$

$$= 0.0032, \text{ or } 0.32\%$$

Summary

A summary of the risk evaluation of the ILRT interval changes using the previously approved methodology is presented in Table 5.

Regulatory Guide 1.174 provides guidance for determining the risk impact of plant-specific changes to the licensing basis. Regulatory Guide 1.174 defines very small changes in risk as resulting in increases of CDF below 1E-06/year and increases in LERF below 1E-07/year. Since the ILRT does not impact CDF, the relevant metric is LERF. Calculating the increase in LERF involves determining the impact of the ILRT interval on the leakage probability.

Table 5
Summary of Results of ILRT Interval
Risk Evaluation (Using Previously Approved Approach)

ILRT Interval	ILRT Risk Contribution	LERF (per year)	ΔLERF from baseline (per year)	ΔLERF from current (per year)
baseline (3 in 10 years)	1.19%	6 28E-07	—	—
current (1 in 10 years)	1.30%	6 91E-07	6.28E-08	—
proposed (1 in 15 years)	1.36%	7.22E-07	9.42E-08	3 14E-08

For comparison purposes, the evaluation results from the CEOG JAR, derived using differences in assumptions and methodology, are presented in Table 6

Table 6
Summary of Results of ILRT Interval Risk Evaluation (using CEOG JAR approach)

ILRT Interval	ILRT Risk Contribution	LERF	ΔLERF from baseline	ΔLERF from current
baseline (3 in 10 years)	0.79%	4.158E-06	—	—
current (1 in 10 years)	1.43%	4.166E-06	7.594E-09	—
proposed (1 in 15 years)	1.90%	4.172E-06	1.329E-08	5.695E-09

Conclusion

The risk associated with extending the ILRT interval is quantifiable. FPL has utilized two alternate methodologies to quantify the risk and evaluate the proposed change in the ILRT interval to 15 years. Both methodologies demonstrate the risk associated with the extension of the interval is small. On this basis, FPL requests approval of a one-time extension of the Saint Lucie Unit 1 ILRT interval to 15 years.

References

1. WCAP-15691, Revision 02, "Joint Applications Report for Containment Integrated Leak Rate Test Interval Extension," June 2002.
2. Florida Power Letter to USNRC, 3F0601-06, June 20, 2001, Crystal River-Unit 3 – License Amendment Request #267, Revision 2, "Supplemental Risk-Informed Information in Support of License Amendment Request #267."
3. EPRI TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Interval," August 1994.
4. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension, page 12.
5. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension, page 11.
6. WCAP-15691 Revision 02, Appendix C, Table C2-6.
7. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension, page 13.

Attachment 2

Sensitivity Evaluation Comparing the CEOG JAR ILRT Methodology with an Alternate Previously Approved Methodology for Saint Lucie Unit 2

Attachment 2

SENSITIVITY EVALUATION COMPARING THE CEOG JAR METHODOLOGY WITH AN ALTERNATE PREVIOUSLY APPROVED METHODOLOGY FOR SAINT LUCIE UNIT 2

The FPL submittal references the Combustion Engineering Owners Group (CEOG) Joint Applications Report (JAR) (Reference 1) for the supporting technical justification for the request of a one-time extension of the Integrated Leak Rate Test (ILRT) interval to 15 years.

The purpose of this write-up is to present a plant-specific analysis using the methodology that was used for the Crystal River 3 application (Reference 2). Note that FPL believes the methodology applied in the CEOG JAR to be reasonable and consistent with good practice in risk-informed evaluations. The results of the CEOG evaluation, which represents the use of a best-estimate approach to establish the probability of the small isolation failures of interest, demonstrate an even better risk justification of the request. The previously approved methodology utilizes a 95th percentile estimate of the probability of the small isolation events and the results reflect a somewhat greater impact of the change on overall risk. Other differences between the methodologies will be described in the body of the evaluation below. The change is demonstrated to be risk insignificant in both methodologies.

Both of the methodologies followed the same general approach to the evaluation of the risk of the interval extension There were differences in the approaches in the assumptions and in the development of a probability estimate for the release class 3 events. The methodologies:

- Both utilize the EPRI TR-104285 (Reference 3) release classes to categorize the various containment failure scenarios.
- Both establish the plant-specific frequencies for each EPRI release class.
- Both define estimated leakage for each release class.
- Both quantify the risk for each release class by multiplying the class frequency times the assumed leakage.
- Both evaluated a baseline case (3 tests in 10 years), a current case (1 test in 10 years), and the proposed case (1 test in 15 years).

Table 1 summarizes the treatment of each of the EPRI Release Classes and provides a summary of some of the differences between the CEOG JAR and the CR3 methodologies.

Table 1
EPRI Release Class Definitions

Release Class	Description	CR3 Submittal	CEOG JAR (Table D2-2 of Reference 1)
1	No containment failure	Frequency reduced as Class 3 increases; leakage magnitude increases to 2 L_a	Frequency reduced with Class 3 increase, considered leakage of L_a
2	Large isolation failures	No change from baseline consequence measures; considered leakage of 35 L_a	No change from baseline consequence measures; considered leakage of 200 L_a
3	Isolation failures	3a: small leaks, 10 L_a, non-LERF 3b: large leaks, 35 L_a, LERF Probability derived using 95th %-ile χ^2 distribution of NUREG-1493 data	3a: small leaks, 25 L_a, non-LERF 3b: large leaks, 200 L_a, LERF Probability derived using log-normal distribution of NUREG-1493 data
4,5	Other small isolation failures (LLRT)	No change from baseline consequence measures; not analyzed	No change from baseline consequence measures; not analyzed
6	Other isolation failures	No change from baseline consequence measures; considered leakage of 35 L_a	No change from baseline consequence measures, considered leakage of 70 L_a
7	Induced failures	No change from baseline consequence measures; considered leakage of 100 L_a	No change from baseline consequence measures, considered leakage of 560 L_a
8	*Bypass*	*Characterized by SGTR scenario* – not impacted by ILRT extension	*Characterized by SGTR and* ISLOCA – not impacted by ILRT extension

Evaluation of Baseline ILRT Interval

The plant-specific evaluation of risk for the baseline case ILRT interval for Saint Lucie Unit 2 is presented in Table 2. The release frequencies for the Class 2, 6, 7, and 8 bins are taken from the CEOG JAR, which had compiled these data based on the Saint Lucie Unit 2 PSA As noted in Table 1, the risk associated with the Class 4 and 5 bins is not impacted by the ILRT interval and is *not analyzed here. The release frequencies for* the Class 3a and 3b *bins are* determined based on the previously approved methodology (See next paragraph). The release frequency for Class 1 is the value of core damage frequency (CDF) reduced by the frequencies of the Class 3a and 3b scenarios. (Note – the CEOG JAR had utilized a value of CDF representative of sequences in which the containment remains intact. This value was approximately 67% of total CDF. The previously approved methodology used total CDF. Total CDF will be used in this plant-specific evaluation.)

The Class 3a and 3b frequencies in the previously approved methodology were determined based on a 95th percentile χ^2 distribution of the NUREG-1493 data. For the baseline ILRT interval (3 tests in 10 years), this resulted in a frequency for Class 3a of 0 064 (Reference 4) times CDF and a *frequency for Class 3b of 0.021 (Reference 5) times CDF. These frequencies are used in the Saint* Lucie Unit 2 evaluation presented in Table 2. Note the total CDF for Saint Lucie Unit 2 is 2 44E-05 per year and the intact containment release frequency is 1.63E-05 per year based on the current plant risk model

Table 2
Saint Lucie Unit 2 Risk Evaluation of Baseline ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	FREQ(intact)-FREQ(3a)-FREQ(3b)-FREQ(6) = 1.42E-05 (Reference 7)	L_a = 1.84E+05 (Reference 6)	2 62
2	1.63E-08	35 L_a = 6 44E+06	0 10
3a	0.064 x CDF = 1 56E-06	10 L_a = 1.84E+06	2 87
3b	0.021 x CDF = 5 12E-07	35 L_a = 6 44E+06	3 30
6	0.0E+00	35 L_a = 6 44E+06	0 00
7	2.17E-06	100 L_a = 1.84E+07	39 93
8	5 88E-06	1.39E+08 (Reference 6)	817.32
		Total Risk	866.14

In the CEOG JAR, a risk contribution of the intact containment sequences (i e , Classes 1, 3a, and 3b) was determined. Using the previously approved methodology, the risk contribution due to the ILRT Type A testing was considered to be due to the Class 3a and 3b scenarios. From Table 2, it can be seen that the risk contribution associated with the ILRT testing interval considering Classes 3a and 3b is:

$$\% \text{ Risk} = [(\text{Risk}_{\text{Class 3a}} + \text{Risk}_{\text{Class 3b}}) / \text{Total Risk}] \times 100$$

$$= [(2.87 + 3.30) / 866.14] \times 100$$

$$= 0.71\%$$

In the CEOG JAR, it was also assumed that the Class 2, 3b, 6, 8, and half the Class 7 (half the class 7 was considered to be 'early') scenarios could lead to large early releases and thus, contribute to large early release frequency (LERF) The previously approved methodology focused only on the Class 3b scenario, which is the only one affected by the consideration of the ILRT interval. As the parameter of concern in the evaluation is ΔLERF, and because Class 3b is the only class affected by the interval extension, ΔLERF is compared on a consistent basis in both methodologies. Thus, for this evaluation the baseline LERF is the Class 3b frequency, or 5.12E-07 per year.

Risk Evaluation of the Current ILRT Interval (1 in 10 years)

This evaluation of the 'once in 10 years' interval will be performed using the same approach as taken above for the baseline case. The frequencies for all release classes, except Class 1, 3a, and 3b, are unaffected by the change in the interval and remain as in Table 2. And the releases for all of the classes are the same as those shown in Table 2 for the baseline case.

The increased probability of not detecting excessive leakage in a Type A test directly impacts the frequencies of the Class 3 events. Based on the previously approved methodology, the Class 3a and 3b frequencies are determined by simply multiplying the baseline frequency by a factor of 1.1. With this change in the Class 3 frequencies, the Class 1 frequency is also adjusted to preserve the total CDF. The evaluation of the current interval is presented in Table 3.

Table 3
Saint Lucie Unit 2 Risk Evaluation
of Current ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	FREQ(intact)-FREQ(3a)-FREQ(3b)-FREQ(6) = 1.40E-05 (Reference 7)	L_a = 1.84E+05 (Reference 6)	2.58
2	1.63E-08	35 L_a = 6 44E+06	0 10
3a	1.1 x 0.064 x CDF = 1.72E-06	10 L_a = 1.84E+06	3 16
3b	1.1 x 0.021 x CDF = 5 64E-07	35 L_a = 6 44E+06	3 63
6	0 00E+00	35 L_a = 6 44E+06	0.00
7	2.17E-06	100 L_a = 1.84E+07	39.93
8	5.88E-06	1.39E+08 (Reference 6)	817.32
		Total Risk	866 72

As was noted above for the baseline evaluation·

- *the risk contribution due to the Type A test interval is [(3.16 + 3.63) / 866.72] x 100, or* 0.78%.
- the LERF for the current interval evaluation is the Class 3b frequency, or 5.64E-07 per year.

Risk Evaluation of the Proposed ILRT Interval (1 in 15 years, one-time)

This evaluation of the 'once in 15 years' interval will be performed using the same approach as taken above for the baseline case The frequencies for all release classes, except Class 1, 3a, and 3b, are unaffected by the change in the interval and remain as in Table 2. And the releases for all of the classes are the same as those shown in Table 2 for the baseline case.

The increased probability of not detecting excessive leakage in a Type A test directly impacts the frequencies of the Class 3 events. Based on the previously approved methodology, the Class 3a and 3b frequencies are determined by simply multiplying the baseline frequency by a factor of 1.15. With this change in the Class 3 frequencies, the Class 1 frequency is also adjusted to preserve the total CDF. The evaluation of the current interval is presented in Table 4.

Table 4
Saint Lucie Unit 2 Risk Evaluation
of Proposed ILRT Interval

Class	Frequency (per reactor-year)	Release (person-rem)	Risk (person-rem/year)
1	CDF- freq(3a)-freq(3b) = 1 39E-05	L_a = 1 84E+05	2 56
2	1.63E-08	35 L_a = 6 44E+06	0 10
3a	1.15 x 0 064 x CDF = 1.80E-06	10 L_a = 1 84E+06	3 30
3b	1.15 x 0 021 x CDF = 5 89E-07	35 L_a = 6 44E+06	3 79
6	0.00E+00	35 L_a = 6 44E+06	0 00
7	2.17E-06	100 L_a = 1.84E+07	39 93
8	5 88E-06	1.39E+08	817 32
		Total Risk	867.01

As was noted above for the baseline evaluation:

the risk contribution due to the Type A test interval is [(3.30 + 3 79) / 867.01] x 100, or 0 82%.
the LERF for the proposed interval evaluation is the Class 3b frequency, or 5.89E-07 per year.

Conditional Containment Failure Probability

Another parameter of interest in evaluating the risk impact of a change to the ILRT interval is the conditional containment failure probability (CCFP). In the CEOG JAR methodology, ΔLERF was considered to be directly related to ΔCCFP. The results using that approach were a ΔCCFP of 0.07% due to the proposed interval compared to the current interval, and 0.16% due to the change to the proposed interval compared to the baseline case. In the previously approved methodology that was used in the plant-specific evaluation developed in this submittal, CCFP was defined as:

CCFP = 1 – (frequency of no containment failure sequences / CDF), or CCFP = 1 – [freq (Cl1)+freq (Cl3a)]/CDF

Further, the sequences representing no containment failure were considered to be the Class 1 and 3a events Thus, using this approach and the information from Tables 2, 3, and 4, the ΔCCFP between the current ILRT interval and the proposed ILRT interval may be derived by:

$$\Delta CCFP_{c\ to\ p} = \{[freq\ (Cl1) + freq\ (Cl3a)]_c - [freq\ (Cl1) + freq\ (Cl3a)]_p\} / CDF$$

$$= \{[1.40E\text{-}05 + 1.72E\text{-}06] - [1.39E\text{-}05 + 1.80E\text{-}06]\} / 2.44E\text{-}05$$

$$= 0.0011, \text{ or } 0.11\%$$

Similarly, the impact of the proposed ILRT interval compared with the baseline ILRT interval is given by:

$$\Delta CCFP_{b\ to\ p} = \{[freq\ (Cl1) + freq\ (Cl3a)]_b - [freq\ (Cl1) + freq\ (Cl3a)]_p\} / CDF$$

$$= \{[1.42E\text{-}05 + 1.56E\text{-}06] - [1.39E\text{-}05 + 1.80E\text{-}06]\} / 2.44E\text{-}05$$

$$= 0.0032, \text{ or } 0.32\%$$

Summary

A summary of the risk evaluation of the ILRT interval changes using the previously approved methodology is presented in Table 5.

Regulatory Guide 1.174 provides guidance for determining the risk impact of plant-specific changes to the licensing basis. Regulatory Guide 1.174 defines very small changes in risk as resulting in increases of CDF below 1E-06/year and increases in LERF below 1E-07/year. Since the ILRT does not impact CDF, the relevant metric is LERF. Calculating the increase in LERF involves determining the impact of the ILRT interval on the leakage probability.

Table 5
Summary of Results of ILRT Interval
Risk Evaluation (Using Previously Approved Approach)

ILRT Interval	ILRT Risk Contribution	LERF (per year)	ΔLERF from baseline (per year)	ΔLERF from current (per year)
baseline (3 in 10 years)	0 71%	5.12E-07	—	—
current (1 in 10 years)	0 78%	5 64E-07	5.124E-08	—
proposed (1 in 15 years)	0 82%	5 89E-07	7.686E-08	2.562E-08

For comparison purposes, the evaluation results from the CEOG JAR, derived using differences in assumptions and methodology, are presented in Table 6

Table 6
Summary of Results of ILRT Interval
Risk Evaluation (using CEOG JAR approach)

ILRT Interval	ILRT Risk *Contribution*	LERF	ΔLERF *from baseline*	ΔLERF *from current*
baseline (3 in 10 years)	0 49%	5 925E-06	—	—
current (1 in 10 years)	0 89%	5 931E-06	5.477E-09	—
proposed (1 in 15 years)	1.19%	5 935E-06	9.585E-09	4 108E-09

Conclusion

The risk associated with extending the ILRT interval is quantifiable. FPL has utilized two alternate methodologies to quantify the risk and evaluate the proposed change in the ILRT interval to 15 years. Both methodologies demonstrate the risk associated with the extension of the interval is small. On this basis, FPL requests approval of a one-time extension of the Saint Lucie Unit 2 ILRT interval to 15 years.

References

1. WCAP-15691, Revision 02, "Joint Applications Report for Containment Integrated Leak Rate Test Interval Extension," June 2002.
2. Florida Power Letter to USNRC, 3F0601-06, June 20, 2001, Crystal River-Unit 3 – License Amendment Request #267, Revision 2, "Supplemental Risk-Informed Information in Support of License Amendment Request #267".
3. EPRI TR-104285, "Risk Impact Assessment of Revised Containment Leak Rate Testing Interval," August 1994.
4. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension, page 12.
5. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension, page 11.
6. WCAP-15691 Revision 02, Appendix D, Table D2-6.
7. FPC Calculation F-01-0001, Revision 2, Evaluation of Risk Significance of ILRT Extension, page 13.

ATTACHMENT 3

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

AND ENVIRONMENTAL CONSIDERATIONS

ATTACHMENT 3

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

INTRODUCTION

The proposed amendments revise Unit 1 and Unit 2 Technical Specifications (TS) Section 6.8.4.h, Containment Leakage Rate Testing Program, to allow a one time 5-year extension to the current 10-year test interval for the containment integrated leak rate test (ILRT). St Lucie has implemented the 10 CFR 50, Appendix J, Option B performance-based containment leak rate test program.

The proposed changes are submitted on a risk-informed basis as described in Regulatory Guide (RG) 1.174, *An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis*. The proposed changes to extend the ILRT surveillance interval are justified based on a combination of risk-informed analysis and assessment of the containment structural condition utilizing ILRT historical results and containment inspection programs. The risk aspects of the justification have been prepared by the Combustion Engineering Owners Group (CEOG) and are presented in a Joint Applications Report (JAR), WCAP–15691, *Joint Applications Report for Containment Integrated Leak Rate Test Interval Extension*, Revision 2, June 2002. Revision 2 of WCAP-15691 was submitted to the NRC for review by CEOG letter CEOG-02-125 dated June 14, 2002.

The Joint Applications Report provides the risk-informed supporting analysis to demonstrate that the increase in risk of extending the ILRT interval from 10 to 15 years is insignificant. That analysis, done in accordance with Regulatory Guide 1.174, shows that the increase in total plant risk due to the extended ILRT interval is less than one half of one percent. The delta-large early release fraction (LERF) is only 5.7E-9/yr and 4.1E-9/yr, respectively, for St. Lucie 1 and 2 when the test interval is increased from 10 to 15 years. The JAR demonstrates that, from a risk perspective, an extension in the interval out to 20 years has an insignificant impact on risk. This is consistent with the findings of NUREG-1493, *Performance Based Containment Leak-Test Program.* This submittal requests only a one time interval extension from 10 to 15 years.

DETERMINATION OF NO SIGNIFICANT HAZARDS CONSIDERATION

The standards used to arrive at a determination that a request for amendment involves a no significant hazards consideration are included in the Commission's regulation, 10 CFR 50.92, which states that no significant hazards considerations are involved if the operation of the facility in accordance with the proposed amendment would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. Each standard is discussed as follows:

(1) Operation of the facility in accordance with the proposed amendments would not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated. The proposed amendments of the Technical Specifications add a one time extension to the current surveillance interval for Type A testing (ILRT). The current test interval of 10 years, based on performance history, would be extended on a one time basis to 15 years from the last Type A test. The proposed extension to Type A testing cannot increase the probability of an accident previously evaluated since the containment Type A test is not a modification, nor a change in the way that plant systems, structures, or components (SSC) are operated, and is not an activity that could lead to equipment failure or accident initiation. The proposed extension of the test interval does not involve a significant increase in the consequences of an accident since research documented in NUREG-1493, *Performance Based Containment Leak-Test Program*, has found that generically, very few potential leak paths are not identified with Type B and C tests. NUREG-1493 concluded that an increase in the test interval to 20 years resulted in an imperceptible increase in risk. St. Lucie Units 1 and 2 provide a high degree of assurance through testing and inspection that the containment will not degrade in a manner only detectable by Type A testing. Inspections required by the ASME code and the Maintenance Rule are performed in order to identify indications of containment degradation that could affect leak-tightness. Type B and C testing required by 10 CFR 50 Appendix J are not affected by this proposed extension to the Type A test interval and will continue to identify containment penetrations leakage paths that would otherwise require a Type A test.

(2) Operation of the facility in accordance with the proposed amendments would not create the possibility of a new or different kind of accident from any previously evaluated.

The proposed changes do not result in operation of the facility that would create the possibility of a new or different kind of accident from any accident previously evaluated. The proposed extension to Type A testing does not create a new or different type of accident for St. Lucie because no physical plant changes are made and no compensatory measures are being imposed that could potentially lead to a failure. There are no operational changes that could introduce a new failure mode or create a new or different kind of accident. The proposed changes only add a one time extension to the current interval for Type A testing and do not change implementation aspects of the test.

(3) **Operation of the facility in accordance with the proposed amendments would not involve a significant reduction in a margin of safety.**

The proposed changes would not result in operation of the facility involving a significant reduction in a margin of safety. The proposed license amendments add a one time extension to the current interval for Type A testing. The current test interval of 10 years, based on historical performance, would be extended on a one time basis to 15 years from the last Type A test. The NUREG-1493 generic study of the effects of extending the Type A test interval out to 20 years concluded that there is an imperceptible increase in plant risk. Further, the extended test interval would have a minimal affect on such risk since Type B and C testing detect over 95 percent of potential leakage paths. A plant specific risk calculation, as part of the CEOG joint application report, on this topic obtained results consistent with the generic conclusions of NUREG-1493. The overall increase in risk contribution was determined as 0.49 percent for Unit 1 and 0.30 percent for Unit 2.

Based on the above, we have determined that the proposed amendments do not (1) involve a significant increase in the probability or consequences of an accident previously evaluated, (2) create the possibility of a new or different kind of accident from any previously evaluated, or (3) involve a significant reduction in a margin of safety; and therefore does not involve a significant hazards consideration.

ENVIRONMENTAL IMPACT CONSIDERATION DETERMINATION

The proposed license amendments change requirements with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The proposed amendments involve no significant increase in the amounts and no significant change in the types of any effluents that may be released off-site, and no significant increase in individual or cumulative occupational radiation exposure. FPL has concluded that the proposed amendments involve no significant hazards consideration, and therefore, meet the criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), an environmental impact statement or environmental assessment need not be prepared in connection with issuance of the amendments.

ATTACHMENT 4

ST. LUCIE UNIT 1 MARKED-UP TECHNICAL SPECIFICATION PAGE

ADMINISTRATIVE CONTROLS

(2) conform to the guidance of Appendix I to 10 CFR Part 50, and
(3) include the following:

1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM.

2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and

3) Participation in a Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

h. Containment Leakage Rate Testing Program

A program to implement the leakage rate testing of the containment as required by 10 CFR 50.54(o) and 10 CFR 50 Appendix J, Option B, as modified by approved exemptions. This program is in accordance with the guidelines contained in Regulatory Guide 1.163, "Performance-Based Containment Leak-Test Program," as modified by the following exception (s):

a. Bechtel Topical Report, BN-TOP-1 or ANS 56.8-1994 (as recommended by R.G. 1.163) will be used for type A testing.

The peak calculated containment internal pressure for the design basis loss of coolant accident P_a, is 39.6 psig. The containment design pressure is 44 psig.

The maximum allow containment leakage rate, L_a, at P_a, shall be 0.50% of containment air weight per day.

Leakage rate acceptance criteria are:

a. Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 6.0\ L_a$ for the Type B and C tests, $\leq 0.75\ L_a$ for Type A tests, and $\leq 0.27\ L_a$ for secondary containment bypass leakage paths.

b. Air lock testing acceptance criteria are:

1) Overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$.

2) For the personnel air lock door seal, leakage rate is $< 0.01\ L_a$ when pressurized to $\geq 1.0\ P_a$.

3) For the emergency air lock door seal, leakage rate is $< 0.01\ L_a$ when pressurized to ≥ 10 psig.

b. The first Type A test performed after the May 1993 Type A test shall be no later than May 2008.

ATTACHMENT 5

ST. LUCIE UNIT 2 MARKED-UP TECHNICAL SPECIFICATION PAGE

than 8 days in gaseous effluents released from each unit to areas beyond the SITE BOUNDARY conforming to Appendix I to 10 CFR Part 50,

10) Limitations on the annual dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources conforming to 40 CFR Part 190.

g. Radiological Environmental Monitoring Program

A program shall be provided to monitor the radiation and radionuclides in the environs of the plant. The program shall provide (1) representative measurements of radioactivity in the highest potential exposure pathways, and (2) verification of the accuracy of the effluent monitoring program and modeling of environmental exposure pathways. The program shall (1) be contained in the ODCM, (2) conform to the guidance of Appendix I to 10 CFR Part 50, and (3) include the following:

1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM,

2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and

3) Participation in a Interlaboratory Comparison Program to ensure that independent checks on the precision and accuracy of the measurements of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring.

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a. Bechtel Topical Report, BN-TOP-1 or ANS 56.8-1994 (as recommended by R.G. 1.163) will be used for type A testing.

The peak calculated containment internal pressure for the design basis loss of coolant accident P_a, is 41.8 psig. The containment design pressure is 44 psig.

The maximum allowable containment leakage rate, L_a, at P_a, shall be 0.50% of containment air weight per day.

b The first Type A test performed after the June 1992 Type A test shall be no later than June 2007.

ATTACHMENT 6

ST. LUCIE UNIT 1 RETYPED TECHNICAL SPECIFICATION PAGE

(2) conform to the guidance of Appendix I to 10 CFR Part 50, and
(3) include the following:

1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM

2) A Land Use Census to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the monitoring program are made if required by the results of this census, and

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b) The first Type A test performed after the May 1993 Type A test shall be no later than May 2008.

The peak calculated containment internal pressure for the design basis loss of coolant accident P_a, is 39 6 psig. The containment design pressure is 44 psig

The maximum allowed containment leakage rate, L_a, at P_a, shall be 0.50% of containment air weight per day.

Leakage rate acceptance criteria are:

a Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first unit startup following testing in accordance with this program, the leakage rate acceptance criteria are $< 6.0\ L_a$ for the Type B and C tests, $\leq 0.75\ L_a$ for Type A tests, and $\leq 0.27\ L_a$ for secondary containment bypass leakage paths

b. Air lock testing acceptance criteria are:

1) Overall air lock leakage rate is $\leq 0.05\ L_a$ when tested at $\geq P_a$

2) For the personnel air lock door seal, leakage rate is $< 0.01\ L_a$ when pressurized to $\geq 1.0\ P_a$.

3) For the emergency air lock door seal, leakage rate is $< 0.01\ L_a$ when pressurized to ≥ 10 psig.

ATTACHMENT 7

ST. LUCIE UNIT 2 RETYPED TECHNICAL SPECIFICATION PAGE than 8 days in gaseous effluents released from each unit to areas beyond the SITE BOUNDARY conforming to Appendix I to 10 CFR Part 50,

10) Limitations on the annual dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources conforming to 40 CFR Part 190.

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1) Monitoring, sampling, analysis, and reporting of radiation and radionuclides in the environment in accordance with the methodology and parameters in the ODCM.

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